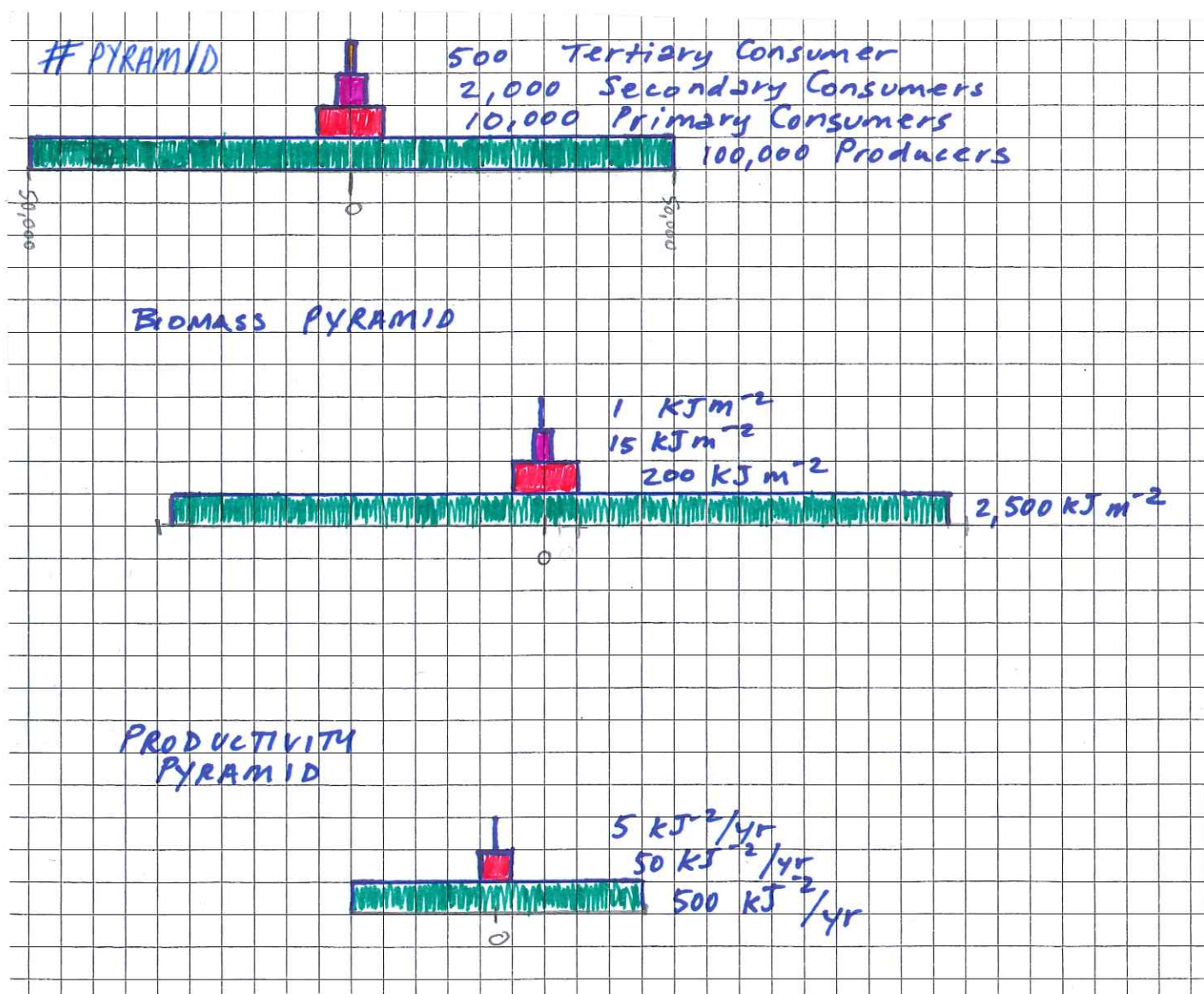


Ecological Pyramids

2.1.4 Explain the principles of pyramids of numbers, pyramids of biomass, and pyramids of productivity, and construct such pyramids from given data

2.1.5 Discuss how the pyramid structure affects the functioning of an ecosystem

	A	B	C
	Number Pyramid	Biomass Pyramid (kJ m ⁻²)	Productivity Pyramid (kJ ⁻² /yr)
Primary Producers	100,000	2,500	500
Primary Consumers	10,000	200	50
Secondary Consumers	2,000	15	5
Tertiary Consumers	500	1	--



Things to look at in Ecological Pyramids:

- The concentration of toxic substances in food chains
- The vulnerability of top carnivores
- The limited length of food chains

Bioaccumulation & Biomagnification →
Chemicals move up trophic levels.

Each trophic level "loses 90%" of Energy (used during metabolism) → ONLY 10% goes up. Food chains can't be too long or there isn't enough E for top Carnivores.

Top trophic levels are always vulnerable to changes lower down. Top carnivores have limited prey so changes in prey population have big impacts.

Type of Pyramid	Units	Description	Pros and Cons
Pyramid of Numbers	a number	# of Organisms @ each trophic level. ↓ Shows relative # in an ecosystem. * SNAPSHOT of a moment	<u>Pros</u> : Simple, easy to compare for changes in populations or seasons. <u>Cons</u> : All organisms included regardless of size; doesn't allow for diff. in ages. #'s can be too big to easily represent.
Biomass Pyramid	g m ⁻² (land) g m ⁻³ (liquids) J (energy content)	Biomass x Area <u>or</u> # of individuals of orgs * Shows E stored @ each trophic level. * SNAPSHOT	<u>Pros</u> : ↑ doesn't have these Cons. • Pyramids of same shape don't necess. have same energy content ↓ <u>Cons</u> : • Uses samples from an ecosystem (not entire ecosystem) • time of yr. impacts results.
Pyramid of Productivity	J m ⁻² /yr g m ⁻² yr ⁻¹ ↓ g m ⁻² wk ⁻¹	* Shows flow of E through each t. level. ↳ shows how much E is generated & available as food. * Flow of Energy OVER Time.	<u>Pros</u> : • show E transferred • can compare ecosystems & energy flows. <u>Cons</u> : Hard to collect data.

* For all pyramids it is hard to assign organisms to a trophic level when they may belong to more than one.